

PATENT SPECIFICATION

L153,196



NO DRAWINGS

L153,196

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COMPLETE SPECIFICATION

Method of Dyeing Hair

We, SCHWARZKOPF VERWALTUNG G.M.B.H.,
a body corporate and existing under the laws
of Germany, of Hohenzollernring 127—129,
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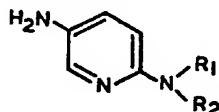
5 SCHWARZKOPF, do hereby declare the invention,
for which we pray that a patent may be
granted to us, and the method by which it is
to be performed, to be particularly described
in and by the following statement:—

10 This invention relates to oxidation hair
dyes, i.e. hair dyes which are applied to the
hair and oxidised *in situ* to develop the dye
colour.

In our U.K. patent specification No.
15 1,026,978 there is disclosed and claimed a
method of dyeing hair in which the hair is
treated with a neutral or slightly alkaline com-
position containing 2,5-diaminopyridine. After
application the dye is developed by oxidation,
20 for example, by means of hydrogen peroxide.
By this method a good red colour can be ob-
tained which is highly resistant to moisture.

In accordance with the present invention it
has been found that equally satisfactory results
25 can be obtained using 2,5-diaminopyridines
substituted in the 2-amino group. In particular
the dyes according to the present invention are
excellent for obtaining red and orange nuances
30 in the hair which have a high resistance to
washing, light and diffusion, are uniform in the
colours obtained and are stable over a wide
pH range. These dyes are therefore markedly
superior to the previously used nitro com-
pounds.

35 The substituted 2,5-diaminopyridines used
in this invention are of the formula



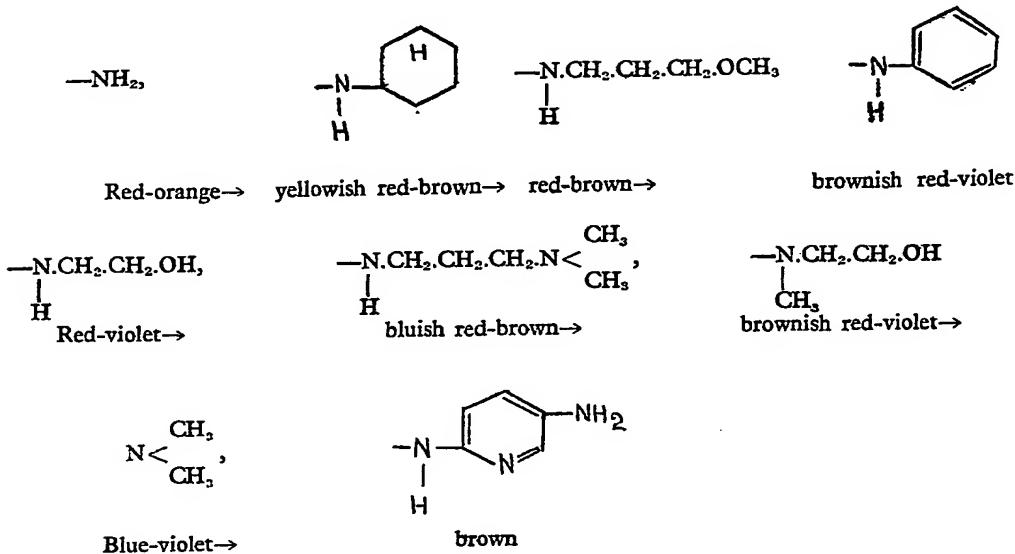
where R₁ represents hydrogen or an alkyl,
cycloalkyl, hydroxyalkyl, amino-
alkyl, alkoxyalkyl or aryl group; 40
and

R₂ represents an alkyl, cycloalkyl,
hydroxyalkyl, aminoalkyl, dialkyl-
aminoalkyl, aralkylalkoxyalkyl aryl
or aminopyridyl group.

Typical substituents on the 2-amino nitrogen
include methyl, hydroxyethyl, cyclohexyl,
methoxypropyl, dimethylaminopropyl, benzyl
and phenyl. These derivatives may be used
either alone, combined with one another or
combined with known benzenoid oxidation dyes
or pyridine oxidation dyes.

In contrast to unsubstituted 2,5-diaminopyr-
idine, which can be used to provide only a red
tint, the use of the substituted derivatives in
accordance with this invention opens up quite
new nuances for genuine tinting. In general
the following rule can be postulated concerning
the influence of substituents in the 2-amino
group of 2,5-diaminopyridine:

The colouring effect increases from orange
through red to blue-violet in the following
order of substituents:



5 The preparation of the compounds used in
this invention takes place by known methods
and does not form part of the invention. For
example, the 2-alkylamino-5-aminopyridine
compounds may be formed by reacting 2,5-
diaminopyridine with alkyl halides, alkyl sul-
10 phates or diazomethane or by the method of
Tschitschibabin in the presence of sodium
amide. 2-Dimethylamino-5-aminopyridine can
be obtained in good yield by reacting 2-amino-
15 5-nitropyridine with methyl iodide in the
presence of sodium amide and then reducing
the resultant compound, similar to the method
of Tschitschibabin and Knunjanz.

As in the parent case, the dye compound
is applied to the hair in a neutral or slightly
20 alkaline medium, preferably an ammoniacal
medium, and may be a solution, cream or
paste. After application the dye compound,
which is colourless, is developed by oxidation
25 to give the desired colour. This oxidation may
result simply from atmospheric oxygen in
which case rather lighter shades develop, or
oxidation may be effected by using a chemical
oxidant, usually hydrogen peroxide, which may
30 be applied to the hair separately or it may
be mixed with the dye composition immedi-
ately before application. The latter oxidation
method results in deeper fashionable hair
shades.

In addition to the dye compound, the com-

positions will generally contain conventional
additives such as thickeners, stabilisers or
emulsifiers. In the Examples which follow such
additives are not included for the sake of
simplicity.

EXAMPLE 1.
A solution is made up from:

2.0 g. 2 - hydroxyethylamino - 5 - amino-
pyridine - hydrochloride
4.0 g. 25% ammonia and
94.0 g. water.

The solution is applied to bleached hair, left
to act for 30 minutes during which time
atmospheric oxidation takes place. The hair is
then rinsed and dried. The result is a beauti-
ful purple shade with good resistance to
wetting.

EXAMPLE 2.
70 g. of the solution from Example 1 is
mixed with 30 ml 6% hydrogen peroxide and
the mixture is allowed to act on the hair. After
a dyeing time of 20 minutes at room tempera-
ture the hair is rinsed. An extremely deep
stable purple is obtained.

The following table summarises the dyeing
performance of other derivatives of 2,5-di-
aminopyridine using compositions and dyeing
procedures similar to those described in
Examples 1 and 2.

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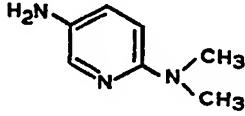
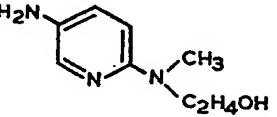
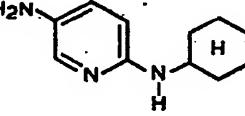
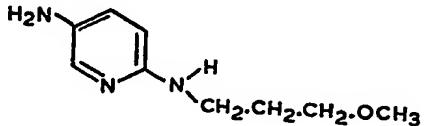
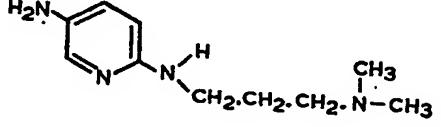
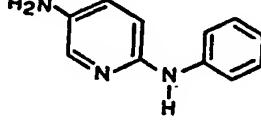
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Example No.	Formula		
3		2-dimethylamino-5-amino-pyridine	blue-violet
4		2-(N-methyl-N-hydroxyethyl)amino-5-aminopyridine	brownish red-violet
5		2-cyclohexylamino-5-aminopyridine	yellowish red-brown
6		2-(γ-methoxypropyl)-amino-5-aminopyridine	red-brown
7		2-(γ-dimethylamino-propyl)amino-5-aminopyridine	Bluish red-brown
8		2-phenylamino-5-aminopyridine	brownish red-violet

EXAMPLE 9.

A solution is made up from:

2.0 g. 2 - dimethylamino - 5 - aminopyridine;
 5 1.0 g. 2 - methyl - hydroxyethylamino - 5 - aminopyridine.
 4.0 g. 25% ammonia
 93 g. water.

10 After application and developing as in example 1 the hair takes on a quiet violet shade. Developed as in example 2 (with H₂O₂) a deep bordeaux red tint is obtained.

EXAMPLE 10.
A solution is made up from:

15 1.0 g. p-toluylenediamine sulphate
 1.0 g. 2 - methyl - hydroxyethylamino - 5 - aminopyridine
 94.0 g. water.
 4.0 g. 25% ammonia

20 The solution is applied to hair and developed as in example 2. The hair is dyed a light chestnut shade.

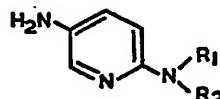
EXAMPLE 11.
A solution is made up from:

25 2.0 g. 2 - hydroxyethyl amino - 5 - amino pyridine - hydrochloride
 0.1 g. 2,6-diaminopyridine
 93.9 g. water.
 4.0 g. 25% ammonia

30 The solution is used as in Example 2, to produce a very natural looking ash blonde tint. In this case the 2,6-diaminopyridine has acted as a modifier.

WHAT WE CLAIM IS:—

35 1. A method of dyeing hair in which the hair is treated with a neutral or slightly alkaline composition containing one or more substituted 2,5-diaminopyridines of the formula:



where R₁ represents hydrogen or an alkyl, 40 cycloalkyl, hydroxyalkyl, aminoalkyl, alkoxyalkyl or aryl group, and R₂ represents an alkyl, 45 cycloalkyl, hydroxyalkyl, aminoalkyl, dialkylaminoalkyl, aralkyl, alkoxyalkyl, aryl or aminopyridyl group, followed by oxidation to develop the dye.

2. A method according to claim 1, in which the said pyridine derivative is 2 - dimethylamino - 5 - aminopyridine, 2 - (N - methyl-N - hydroxyethyl)amino - 5 - aminopyridine, 2 - 2 - cyclohexylamino - 5 - aminopyridine, 2 - (γ - methoxypropyl)amino - 5 - aminopyridine, 2 - (γ - dimethylaminopropyl)amino - 5 - aminopyridine or 2 - phenylamino - 5 - aminopyridine.

3. A method according to claim 1, in which the composition also contains a benzenoid or 50 pyridine compound known as an oxidation hair dye.

4. A method according to any one of the preceding claims, in which the composition is an ammoniacal solution, cream or paste.

5. A method according to any one of the preceding claims, in which the dye is developed by means of a chemical oxidant other than atmospheric oxygen.

6. A method according to claim 5, in which the oxidant is hydrogen peroxide.

7. A method according to claim 5 or 6, in which the oxidant is mixed with the dye composition immediately prior to application to the hair.

8. A method according to claim 1, substantially as described in any one of the foregoing Examples.

9. Hair when dyed by a method claimed in any one of the preceding claims.

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